

Contents

Physical Sensors Plenary Lecture

- Quo vadis silicon sensors? 1
S. Middelhoek (Delft, Netherlands)

Physical Sensors

- Fabrication compatibility of integrated silicon smart physical sensors 11
R.F. Wolffenbuttel (Delft, Netherlands)
- A new two-dimensional capacitive position transducer 29
M.H.W. Bonse, F. Zhu and J.W. Spronck (Delft, Netherlands)
- A novel torque sensor based on elastic waves generated and detected by piezoelectric thick films 33
B. Morten, G. De Cicco and M. Prudenziati (Modena, Italy)
- A non-contact strain-gage torque sensor for automotive servo-driven steering systems 39
E. Zabler, A. Dukart, F. Heintz and R. Krott (Ettlingen, Germany)
- Infrared scanning system for obstacle detection in the automotive field 47
A. Najmi, A. Mahrane, G. Vialaret and D. Esteve (Toulouse, France)
- Sensor for plasma density profile measurement in magnetic fusion machine 53
R. Schubert (Munich, Germany)
- Detection of magnetic field by microwave properties of high- T_c superconductors 58
I. Kirschner (Budapest, Hungary), S. Leppävuori (Oulu, Finland), T. Porjesz (Budapest, Hungary), A. Uusimäki and T. Kokkomäki (Oulu, Finland)
- Integrated resonant magnetic-field sensor 66
Z. Kádár, A. Bossche and J. Mollinger (Delft, Netherlands)
- Fabrication of an HTSC electrical switch 70
L. Bencze, A. Szalay and I. Vajda (Budapest, Hungary)
- Dynamic characteristics of a resonating force transducer 74
A. Cheshmehdoost, S. Stroumboulis, B. O'Connor and B.E. Jones (Uxbridge, UK)
- Pressure microsensor system using a closed-loop configuration 78
B. Hök (Uppsala, Sweden and Västerås, Sweden), L. Tenerz, S. Berg (Uppsala, Sweden) and A. Blücker (Västerås, Sweden)

Optical and Radiation Sensors

- New alpha radiation detection systems for environmental surveys 85
T. Streil (Dresden, Germany), R. Klinke (Duisburg, Germany), A. Erlebach, P. Hübler, W. Kluge, H. Kück and G. Zimmer (Dresden, Germany)
- Extremely high-sensitivity bulk-barrier phototransistor applying a polycrystalline emitter 88
N.S. Nam, I. Zólmoy and A.H. Abdulhadi (Budapest, Hungary)
- Integrated-optical acoustical sensors 93
P. Pliska and W. Lukosz (Zurich, Switzerland)
- Performance evaluation of a novel non-contact fibre-optic triggering probe for surface-topography measurement. . . . 98
C. Butler (Uxbridge, UK) and G. Gregoriou (London, UK)
- Sensor signal processing using neural networks for a 3-D fibre-optic position sensor 102
Q. Yang and C. Butler (Uxbridge, UK)
- Fibre-optic weigh-in-motion sensor 110
M.C. Navarrete and E. Bernabeu (Madrid, Spain)
- Design of a superconducting bolometer for low-power standards in the millimetre wave field 114
D. Andreone, L. Brunetti and M. Petrizzelli (Turin, Italy)

Technologies and New Materials

An integrated silicon colour sensor using selective epitaxial growth	123
M. Bartek, P.T.J. Gennissen, P.J. French, R.F. Wolffenbuttel and P.M. Sarro (Delft, Netherlands)	
Extremely miniaturized capacitive movement sensors using new suspension systems	129
B. Puers and D. Lapadatu (Heverlee, Belgium)	
Applications of fluorocarbon polymers in micromechanics and micromachining	136
H.V. Jansen, J.G.E. Gardeniers, J. Elders, H.A.C. Tilmans and M. Elwenspoek (Enschede, Netherlands)	
Technology and devices for hybrid and monolithically integrated optical sensors	141
H.P. Zappe, H.E.G. Arnot and R.E. Kunz (Zurich, Switzerland)	
Laser ablation deposition as a preparation method for sensor materials	145
S. Leppävuori, J. Levoska, J. Frantti, O. Kusmartseva, H. Moilanen (Oulu, Finland), A.E. Hill, R.D. Tomlinson and R.D. Pilkington (Salford, UK)	
Laser-induced chemical vapour deposition in piezoresistive pressure sensor fabrication	150
H. Moilanen, S. Leppävuori and A. Uusimäki (Oulu, Finland)	
A 3×3 pyroelectric detector array with improved sensor technology	156
W. von Münch, M. Nägele, G. Wöhl (Stuttgart, Germany), B. Ploss and W. Ruppel (Karlsruhe, Germany)	
Determination of the thermal conductivity of CMOS IC polysilicon	161
O.M. Paul, J. Korvink and H. Baltes (Zurich, Switzerland)	

Multicomponent Analysis, Arrays, Pattern Recognition

An integrated multi-element array transducer for ultrasound imaging	167
J.V. Hatfield, N.R. Scales, A.D. Armitage, P.J. Hicks, Q.X. Chen and P.A. Payne (Manchester, UK)	
Methods of processing tactile information based on the solution of Helmholtz's equation	174
J. Volf (Prague, Czech Republic)	

Software, Intelligent Sensors

Concepts and focus point for intelligent sensor systems	183
G.C.M. Meijer (Delft, Netherlands)	
An intelligent gas sensor	192
P. Corcoran and H.V. Shurmer (Derby, UK)	
A low power multi-sensor interface for injectable microprocessor-based animal monitoring system	198
P. Wouters, M. De Cooman, D. Lapadatu and R. Puers (Heverlee, Belgium)	
A model-based sensor for the adaptation of internal combustion engines	207
H.-G. von Garssen and V. Mágori (Munich, Germany)	
A smart capacitive absolute angular-position sensor	212
G.W. de Jong, G.C.M. Meijer, K. van der Lingen, J.W. Spronck, A.M.M. Aalsma and Th.A.J.M. Bertels (Delft, Netherlands)	
An integrated gas flow sensor with high sensitivity, low response time and a pulse-rate output	217
H.J. Verhoeven and J.H. Huijsing (Delft, Netherlands)	

Special Sensor Applications

The merit of using silicon for the development of hearing aid microphones and intraocular pressure sensors	223
P. Bergveld (Enschede, Netherlands)	
Particle micromanipulator consisting of two orthogonal channels with travelling-wave electrode structures	230
G. Fuhr, S. Fiedler, T. Müller, T. Schnelle, H. Glasser, T. Lisec and B. Wagner (Berlin, Germany)	
A micro thermal diffusion sensor for non-invasive skin characterization	240
F. Arnaud, G. Delhomme, A. Dittmar (Lyon, France), P. Girard (Villeurbanne, France), L. Netchiporouk (Kiev, Ukraine), C. Martelet, R. Cespuglio (Lyon, France) and W.H. Newman (Cambridge, MA, USA)	

Fundamentals

Quantum-well pressure sensors	247
W. Trzeciakowski (Warsaw, Poland and Talence, France)	

Applications of a model for silicon resonant sensors	251
A. Prak and J.H.J. Fluitman (Enschede, Netherlands)	
A two-dimensional, high-resolution, charged-particle sensor	256
J.V. Hatfield (Manchester, UK)	
Thermal modeling of multilayer membranes for sensor applications	260
U. Dillner (Jena, Germany)	
Modeling and simulation of solid-state transducers: the thermal and electrical energy domain	268
D.C. van Duyn (Delft, Netherlands)	
Simulation of the thermal behaviour of thermal flow sensors by equivalent electrical circuits	275
F.J. Auerbach, G. Meiendres, R. Müller and G.J.E. Scheller (Munich, Germany)	
Problem-oriented modeling of microtransducers: state of the art and future challenges	279
G. Wachutka (Zurich, Switzerland)	
Nano-technologies, Micromachining	
Measurements of the mechanical behaviour of micromachined silicon and silicon-nitride membranes for microphones, pressure sensors and gas flow meters	287
R. Schellin, G. Hess, W. Kühnel, C. Thielemann, D. Trost, J. Wacker and R. Steinmann (Darmstadt, Germany)	
A micromachined flow sensor for liquid and gaseous fluids	293
F. Kohl, A. Jachimowicz, J. Steurer, R. Glatz, J. Kuttner, D. Biacovský, F. Olcaytug and G. Urban (Vienna, Austria)	
Electropolymerized films for low friction microactuator bearings	300
J.W. Gardner, D.G. Chetwynd, S.T. Smith, S.M. Harb, Z.Q. Yao (Coventry, UK), P.N. Bartlett and V. Eastwick-Field (Southampton, UK)	
PSG layers for surface micromachining	304
D. Poenar, P.J. French, R. Mallée, P.M. Sarro and R.F. Wolffenbuttel (Delft, Netherlands)	
Amorphous silicon carbide and its application in silicon micromachining	310
A. Klumpp, U. Schaber, H.L. Offereins, K. Köhl and H. Sandmaier (Munich, Germany)	
Reactive ion etching (RIE) techniques for micromachining applications	317
Y.X. Li, M.R. Wolffenbuttel, P.J. French, M. Laros, P.M. Sarro and R.F. Wolffenbuttel (Delft, Netherlands)	
Line-addressable torsional micromirrors for light modulator arrays	324
V.P. Jaecklin, C. Linder, N.F. de Rooij, J.-M. Moret and R. Vuilleumier (Neuchâtel, Switzerland)	
Micromachined optical planes and reflectors in silicon	330
L. Rosengren, L. Smith and Y. Bäcklund (Uppsala, Sweden)	
A fiber optical voltage sensor prepared by micromachining and wafer bonding	334
Z. Xiao, S. Norrman and O. Engström (Göteborg, Sweden)	
New applications of r.f.-sputtered glass films as protection and bonding layers in silicon micromachining	338
J.W. Berenschot, J.G.E. Gardeniers, T.S.J. Lammerink and M. Elwenspoek (Enschede, Netherlands)	

Please note that the page numbering for these Proceedings is continuous throughout Volumes A41 and A42, and Author and Subject Indexes will be published at the end of Volume A42.

The publisher encourages the submission of articles in electronic form thus saving time and avoiding rekeying errors. A leaflet describing our requirements is available from the publisher upon request.

